

Characterization after neutron irradiation of Silicon Diodes for the CMS High Granular Calorimeter (HGICAL)

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The CMS collaboration is planning to upgrade the forward calorimeters as these will not be sufficiently performant with the expected HL-LHC (High Luminosity LHC) conditions. One of the proposed calorimeter options is the High Granularity Calorimeter (HGC). It is realized as a sampling calorimeter with layers of silicon detectors that feature very high longitudinal and lateral granularities and a coarser segmentation backing hadronic calorimeter based on scintillators as active material. For the electromagnetic calorimeter (EE) 420m² of silicon detectors and for the Front Hadronic calorimeter (FH) 250m² of silicon detectors with a total of 5.1M channels are anticipated. The sensors are realized as pad detectors of a size in the order of 1 cm² with an active thickness between 100 and 300 μm depending on the position respectively the expected radiation levels. We present our first results after irradiation of 300μ, 200μ and 100μ n-on-p and p-on-n devices that have been made up to fluxes of 1.5E16 n/cm² at Ljubljana and have been measured at Hamburg.

Author: CURRAS RIVERA, Esteban (Universidad de Cantabria (ES))

Presenter: CURRAS RIVERA, Esteban (Universidad de Cantabria (ES))

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